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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/632,388	08/03/2000	Shin Hwa Li	850063.529	1164

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EXAMINER

MALDONADO, JULIO J

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/632,388

Applicant(s)

LI ET AL.

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6, 7, 9, 10, 20 and 22-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 20 and 22-27 is/are allowed.
- 6) ☒ Claim(s) 6, 7, 9, 10 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. The non-final rejection to claims 1-4, 6, 7, 9, 10, 20, and 23-27 as set forth in paper No. 16 is withdrawn in response to applicants' amendments and arguments.
2. The addition of claim 28 is acknowledged.
3. Claims 1-4, 6, 7, 9, 10, 20 and 22-28 are pending in the application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 7, 9, 10 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ngo et al. (U.S. 6,127,261) in view of Dawson (U.S. 5,503,882).

Ngo et al. (Fig.1-3) teach an interlayer dielectric layered structure including a substrate (102); a first dielectric layer (104) disposed over the substrate (102); a layer of undoped silicate glass (112) disposed on the dielectric layer (104); an unplanar layer of borophosphorous silicate glass (114) disposed on the layer of undoped silicate glass (112), said planar layer having an uppermost surface; and a planar dielectric layer (110) of plasma enhanced tetraethylorthosilicate glass disposed on the unplanar layer of borophosphorous silicate glass (114), said planar dielectric layer (110) having an uppermost surface substantially even with the uppermost surface of said unplanar layer of borophosphorous silicate glass (114), the borophosphorous silicate glass layer (114)

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and the planarized layer of plasma-enhanced tetraethyl orthosilicate layer (110) together forming a pre-metal dielectric layer (column 1, line 29 – column 5, line 15).

Ngo et al. fail to teach a second layer of plasma-enhanced tetraethyl orthosilicate overlying the planarized layer of plasma-enhanced tetraethyl orthosilicate layer, directly overlying and being in contact with at least a portion of the borophosphorous silicate glass region having a planar surface. However, Dawson (Fig. 7b) in a related art for planarized integrated circuit topography teaches a planarized layer of plasma-enhanced tetraethylorthosilicate (42); and a capping layer comprising a second layer of plasma-enhanced tetraethyl orthosilicate (52) overlying the planarized layer of plasma-enhanced tetraethyl orthosilicate layer (42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to form the capping layer of Dawson onto the interlayer dielectric structure of Ngo et al. and extend the capping layer in contact with the BPSG, since the capping layer provides a barrier against water sorption into layers below the capping layer (column 9, lines 4-20).

Allowable Subject Matter

6. Claims 1-4, 20 and 22-27 are allowed.
7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record, Ngo et al. to U.S. 6,127,261 teach in Figs.1-3 and related text, an interlayer dielectric layered structure including a substrate (102); a patterned oxide layer (104) disposed over the substrate (102); a layer of undoped silicate glass (112) disposed over the patterned oxide layer (104); a layer of borophosphorous silicate

glass (106) over the layer of undoped silicate glass (112); and a planarized layer of plasma-enhanced tetraethyl orthosilicate (110) over at least a portion of the borophosphorous silicate glass layer (106), the layers of the undoped silicate glass layer (112), the borophosphorous silicate glass layer (106) and the planarized plasma-enhanced tetraethyl orthosilicate layer (110) together forming a pre-metal dielectric layer (column 1, line 29 – column 5, line 15)

Ngo et al. neither teach nor suggest a second layer of plasma-enhanced tetraethyl orthosilicate overlying the planarized layer of plasma-enhanced tetraethyl orthosilicate layer, directly overlying and being in contact with at least a second portion of the borophosphorous silicate glass.

Response to Arguments

8. Applicant's arguments filed 3/13/2003 have been fully considered but they are not persuasive.

Applicants' argue that the combined references of Ngo et al. and Dawson fail to teach the limitations of claims 6 and 28. In reference to applicants' arguments regarding claims 6 and 28, both claims are broad to an intervening material between the borophosphorous silicate glass and the planarized dielectric layer.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

JMR
5/17/03


George Fourson
Primary Examiner